Date: July 30, 2004 Label No. EV 348584105 US

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April D. Brandon — April D. Brandon

Name (Print) Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application No.	:	09/938,894	Confirmation No.:	3333
Applicants	:	Richard T. Reel et al.		
Filed	:	August 24, 2001		
TC/A.U.	:	1753		
Examiner	:	Kaj K. Olsen		
Attorney Docket No.	:	5010-180		
Customer No.:		35411		

SUBMISSION OF APPELLANTS' BRIEF ON APPEAL

Mail Stop Appeal Briefs-Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith are an original and two copies of an Appeal Brief in connection with the above-identified U.S. Patent Application.

Also enclosed is a Credit Card Payment form in the amount of $330.00 to cover the cost of filing this Appeal Brief. In the event that any additional fees are due with respect to this paper, please charge Deposit Account No. 50-0925.

Respectfully submitted,

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Enclosure: Appellants' Brief On Appeal with Appendix

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BRIEF FOR APPELLANTS

Mail Stop Appeal Briefs-Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated May 6, 2004, finally rejecting claims 1-13, which are reproduced as an Appendix to this brief.

A Notice of Appeal, the Notice of Appeal fee of $330.00, and the fee for filing an appeal brief of $330.00, along with two (2) extra copies of this brief, are being filed herewith.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§ 1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment to Deposit Account No. 50-0925.

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I. Real Party in Interest

The present application is assigned to Applera Corporation Applied Biosystems Group.

II. Related Appeals and Interferences

Neither Appellants' legal representative, nor Assignee, knows of any other appeal or interference which will affect, or be directly affected by, or have bearing on, the Board's decision in the present pending appeal.

III. Status of Claims

Claims 1-25 are pending in this application. Claims 14-25 have been withdrawn from consideration. The final rejection of claims 1-13 is appealed.

IV. Status of Amendments

No amendments have been filed after the final rejection of claims 1-13.

V. Summary of Invention

Independent Claim 1

Finally rejected independent claim 1 is directed to an analyte-manipulation device 10 for moving a polarizable analyte of interest with respect to a sample holder 21 that is configured to hold such analyte (*see*, for example, page 5, lines 12-33, and Fig. 1A). The device comprises at least two coextensive, elongated, electrically-conductive members 14, 16 disposed in fixed, spaced relation to one another (*see*, for example, page 5, lines 14-20, and Fig. 1A). The members 14, 16 and the holder 21 are adapted for relative movement between a first position wherein at least a portion each member is disposed within the holder (*see*, for example, page 5, lines 30-32), and a second position wherein the members are disposed outside of the holder (*see*, for example, page 5, line 30 - page 6, line 11, e.g. page 6, lines 4 - 6). An AC power source 20 is adapted for electrical communication with the electrically-conductive members 14, 16 (*see*, for example, page 65, lines 24-26, and Fig. 1A). When the members 14, 16 and holder 21 are disposed at the first position, the AC power source 20 is operable in combination with the electrically-conductive members 14, 16 to establish

an electrical field gradient within the holder 21, adjacent the members 14, 16 (*see*, for example, page 5, line 32-page 6, line 3).

Dependent Claim 2

Dependent claim 2 depends from independent claim 1, and therefore includes all of the features of claim 1, as discussed above. Moreover, claim 2 is directed to the analyte-manipulation device comprising a control unit for controlling the position of the electrically-conductive members 14, 16 with respect to the sample holder 21, for example, *see* page 6, lines 2-5, wherein it is disclosed that the gap region 18 between members 14, 16 can be configured to hold a defined volume of liquid and can be moved to a receiving region such as a clean, empty well of a microtiter plate where the DNA can be deposited.

Dependent Claim 3

Dependent claim 3, depends from independent claim 1, and therefore includes all of the features of claim 1, as discussed above. Moreover, claim 3 is directed to the analyte-manipulation device further comprising a holder-handling apparatus for moving the sample holder 21 toward and away from the electrically-conductive members 14, 16. This can include a variation of moving the tip region 20 to a receiving region, wherein the receiving region is instead moved to the tip region, as disclosed, for example, at page 6, lines 2-6.

Independent Claim 4

Independent claim 4 is directed to an analyte-manipulation device, comprising a moveable support 11, at least two coextensive, elongated, electrically-conductive members 14, 16, and wherein the electrically-conductive members 14, 16 are being held by the support 11 for movement therewith, for example, as disclosed at page 5, lines 12-20, and in Fig. 1A. The electrically-conductive members 14, 16 can have spaced-apart end regions, with an intervening region 22 between the end regions defining a concentration zone, for example, as described at page 5, lines 25-28, and shown in Fig. 1A. An AC power source 20 can be adapted for electrical communication with the electrically-conductive members 14, 16 as shown, for example, in Fig. 1A and described at page 5, lines 24-27. Upon positioning the support 11 so that the end regions of members 14, 16 are disposed in an electrolyte solution containing a polarizable analyte of interest, the AC power source 20 is operable in combination with the electrically-conductive members 14, 16 to establish an

electrical field gradient, between the end regions, effective to trap at least a portion of the polarizable analyte in the concentration zone 22. *See*, for example, page 5, line 24 - page 6, line 11.

Dependent Claim 5

Dependent claim 5, depends from independent claim 4, and therefore includes all of the features of claim 4, as discussed above. Moreover, claim 5 is directed to the analyte-manipulation device of claim 4 further comprising a resin material 30, wherein at least a portion of the end region of each electrically-conductive member 14, 16 is contained within the resin material 30. *See*, for example, page 6, lines 27-31, and Fig. 2.

Dependent Claim 6

Dependent claim 6 depends from dependent claim 5, and therefore includes all of the features of claim 5 and claim 4, as discussed above. Moreover, claim 6 is directed to the analyte-manipulation device wherein the resin material 30 comprises an epoxy bead (*see*, for example, page 6, line 30).

Dependent Claim 7

Dependent claim 7, depends from independent claim 4, and therefore includes all of the features of claim 4, as discussed above. Moreover, claim 7 is directed to the analyte-manipulation device of claim 4 further comprising a porous material 36 encapsulating the end regions of the members 14, 16, for example, as described in the specification at page 7, line 7, and shown in Fig. 3.

Dependent Claim 8

Dependent claim 8, depends from independent claim 4, and therefore includes all of the features of claim 4, as discussed above. Moreover, claim 8 is directed to the analyte-manipulation device of claim 4, wherein at least a portion of the at least one electrically conductive member 14, 16 includes one or more surface features selected from the group consisting of edges, corners, angles, bumps, protrusions, teeth, undulations, notches, indentations, waves, ripples, fins, and any combination thereof, for example, as described in the specification at page 7, lines 11-13, and shown in Fig. 4.

Dependent Claim 9

Dependent claim 9, depends from dependent claim 8, and therefore includes all of the features of claims 8 and 4, as discussed above. Moreover, claim 9 is directed to the analyte-manipulation device wherein the members 14, 16 include surface features along confronting

portions of their end regions, which comprise edges or points 40, for example, as described in the specification at page 7, line 17, and shown in Fig. 4.

Dependent Claim 10

Dependent claim 10, depends from independent claim 4, and therefore includes all of the features of claim 4, as discussed above. Moreover, claim 10 is directed to the analyte-manipulation device of claim 4, further comprising a nonconductive filament 34 extending along at least one of the members 14, 16, for example, as described in the specification at page 6, lines 32-35, and shown in Fig. 3.

Dependent Claim 11

Dependent claim 11, depends from independent claim 4, and therefore includes all of the features of claim 4, as discussed above. Moreover, claim 11 is directed to the analyte-manipulation device according to claim 4, wherein the support 11 is configured as a handle permitting an operator to hold and position the device by hand, for example, as described in the specification at page 8, lines 19-23.

Dependent Claim 12

Dependent claim 12, depends from independent claim 4, and therefore includes all of the features of claim 4, as discussed above. Moreover, claim 12 is directed to the analyte-manipulation device of claim 4, wherein two or more pairs of the coextensive, elongated, electrically-conductive members 117 (for example, non-conductive material with a conductive coating, as shown in Fig. 5D), are held by a support 115. *See*, for example, the specification at page 7, line 28 - page 8, line 7, and shown in Fig. 5D.

Dependent Claim 13

Dependent claim 13, depends from independent claim 4, and therefore includes all of the features of claim 4, as discussed above. Moreover, claim 13 is directed to the analyte-manipulation device of claim 4 further comprising a DC power source 24 adapted for electrical communication with the electrically-conductive members 14, 16, for example, as described in the specification at page 6, lines 9-11, and shown in Fig. 1A.

VI. The Issues

Whether claims 1-4, 8, 9, 11, and 12 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 4,911,806 (*Hofmann*) in view of U.S. Patent No. 4,124,470 (*Dahms*).

Whether claims 5-7 and 10 are unpatentable under 35 U.S.C. § 103(a) over *Hofmann* and *Dahms*, as applied to claim 4, and further in view of U.S. Patent No. 4,643,814 (*Goldstein*).

Whether claim 13 is unpatentable under 35 U.S.C. § 103(a) over *Hofmann* and *Dahms* as applied to claim 4, and further in view of WO 97/41219 (*WO '219*).

VII. Grouping of Claims

Claims 1-3 stand or fall together. Claims 4-13 stand or fall together. Appellants explain below why independent claims 1 and 4 are separately patentable.

VIII. Argument

(i) Claims 1-4, 8, 9, 11 and 12 are patentable over *Hofmann* in view of *Dahms*.

Claims 1-4, 8, 9, 11 and 12 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over *Hofmann* in view of *Dahms*.

35 U.S.C. § 103(a) states:

> "a patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

Independent claim 1 is directed to an analyte-manipulation device for moving a polarizable analyte of interest with respect to a sample holder, to hold such analyte. The device includes at least two coextensive, elongated, electrically-conductive members disposed in fixed, spaced relation to one another, with the members and holder being adapted for relative movement between a first position wherein at least a portion of the members is disposed within the holder and a second position wherein the members are disposed outside the holder. An AC power source is adapted for electrical communication with the electrically-conductive members. The members and the holder

are disposed in a first position where the AC power source is operable in combination with the electrically-conductive members to establish an electrical field gradient within the holder, adjacent the members.

The Examiner agrees that *Hofmann* does not disclose a configuration wherein a sample holder and two coextensive, elongated, electrically-conductive members in fixed, spaced relation to one another are adapted for relative movement between a first position wherein at least a portion of the members is disposed within the holder and a second position wherein the members are disposed outside the holder. The Examiner asserts, however, that configuring a manipulation device such that it could be utilized for a plurality of different containers (i.e., that it can be pulled in and out of a particular analyte container) is notoriously known in the art. The Examiner cites *Dahms* as showing a "manipulation device" that is movable into and out of a vessel. The Examiner asserts that *Dahms* is only being relied upon to show the concept of being able to move a particular analyte into and out of a particular container. The Examiner then relies upon case law for the proposition that simply making the prior art adjustable does not impart patentability over the prior art.

To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *See, In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). A 35 U.S.C. § 103 rejection based upon a modification of a reference that destroys the intent, purpose or function of the invention disclosed in the reference, is not proper and the *prima facie* case of obviousness cannot be properly made. In short, there would be no technological motivation for engaging in the modification or change. To the contrary, there would be a disincentive. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Furthermore, the prior art must teach or suggest all of the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

The pair of electrodes 14, 16 in *Hofmann* are supported in spaced apart fashion inside a liquid container 18, with a coil 20 formed of a plurality of turns of wire, surrounding the container 18. Alternatively, the coil could be insulated and mounted within the container, it being understood that the coil must surround the region between the electrodes 14 and 16. The objective in *Hofmann* is to apply first and second electric signals to the electrodes and to the coil, respectively, to thereby generate substantially orthogonal oscillating electric and magnetic fields which are at the same

frequency but approximately 90° out of phase. As a result of these oscillating electric and magnetic fields, particles having different polarization relaxation frequencies and sizes will migrate at different velocities and thereby sort into various factions. *Hofmann* provides absolutely no teaching or suggestion that it would be desirable or even possible to remove the electrically conductive members 14, 16 from the container for any purpose, such as to remove particles that have been separated by the members 14, 16.

In fact, *Hofmann* actually teaches away from any modification of the disclosed apparatus that would allow removal of the electrodes 14, 16 from the container 20. In column 5, lines 1-3, *Hofmann* states that the coil must surround the region between the electrodes 14 and 16, and furthermore, at column 5, lines 57-59, *Hofmann* discloses that baffles or other mechanisms may aid in extracting cell fractions from the container. *Hoffman* makes no suggestion whatsoever about removing the electrodes and doing so appears impossible unless the electrodes are disassembled (*see*, Fig. 1 of *Hoffman*).

The Examiner relies upon *Dahms* for disclosing a way in which an analysis system can be configured to allow it to be inserted into a particular container and subsequently removed. The Examiner also appears to rely upon case law for the proposed modification of *Hofmann* by stating that simply making the prior art adjustable does not impart patentability over the prior art. With regard to the proposed modification of *Hoffman* based on the disclosure of *Dahms*, the Appellants submit that there would be no motivation to modify *Hofmann* in order to arrive at the claimed combination in independent claim 1, since there is no suggestion in either *Dahms* nor in *Hofmann* to do so, and *Hofmann* actually teaches away from such a modification. Furthermore, even if *Dahms* and *Hofmann* were combined in the manner suggested by the Examiner, the combination would not teach all of the claim limitations.

The sampler tube 44 of *Dahms* picks up a small amount of sample from a sample reservoir and then deposits that sample portion in an electrophoretic tube along with a quantity of electrophoretic medium. The sampler tube 44 is clearly not an electrically-conductive member adapted for relative movement between a first position wherein a portion of the member is disposed within a sample holder and a second position wherein the member is disposed outside of the holder. The conductors 35, 40, shown in Fig. 2 of *Dahms*, are also clearly not electrically-conductive members adapted for relative movement between a first position wherein a portion of the members

are disposed within a sample holder and a second position wherein the members are disposed outside of the holder.

The electrodes 14, 16 of *Hofmann*, on the other hand, are not suitable to pick up and move, transfer, or place sample portions. *Hofmann*'s electrodes are supported in a container, into which a sample can be placed. A coil 20 surrounds the region between the electrodes 14, 16 of *Hofmann*. First and second electric signals can be applied to the electrodes and the coil, respectively, to thereby generate substantially orthogonal oscillating electric and magnetic fields that are at the same frequency but approximately 90° out of phase. By selecting the frequency, particles having different polarization relaxation frequencies and sizes will migrate at different velocities and thereby sort into various fractions. If the members 14, 16 were removed from the vessel in *Hofmann*, the sample would remain in the vessel and the separation would be lost. Therefore, the proposed modification of *Hofmann* to remove the electrodes in accordance with the alleged teachings of *Dahms*, would render the prior art invention of *Hofmann* or *Dahms* unsatisfactory for its intended purpose, and therefore there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

With regard to the statement in the Final Office Action that case law has established that simply making the prior art adjustable does not impart patentability over the prior art, Appellants submit that such a modification of *Hofmann*, whereby the electrodes 14, 16 would be removed from the container 20, would not amount to simply making the prior art adjustable, since such a modification would destroy the intended function of the device disclosed in *Hofmann* as discussed above.

For at least the above reasons, neither *Hofmann* nor *Dahms*, whether considered individually or in combination, provide any disclosure or suggestion of an analyte-manipulation device that includes at least two coextensive, elongated, electrically-conductive members disposed in fixed, spaced relation, with the members and a sample holder being adapted for relative movement between a first position wherein at least a portion of the members is disposed within the holder and a second position wherein the members are disposed outside of the holder. As discussed above, the proposed modification of *Hofmann* would render the invention of *Hofmann* unsatisfactory for its intended purpose, and therefore there is no suggestion or motivation to make the proposed modification. Accordingly, Appellants submit that the Office Action fails to establish *prima facie*

obviousness of the invention set forth in independent claim 1, and reversal of the final rejection under 35 U.S.C. § 103(a) is respectfully requested. Dependent claims 2 and 3 include all of the features of independent claim 1, and are therefore also patentable over the combination of *Hofmann* and *Dahms* for at least the reasons discussed above.

(ii) Claims 4-13 are separately patentable over *Hofmann* in view of *Dahms*.

Independent claim 4 is directed to an analyte-manipulation device that includes a movable support, at least two coextensive, elongated, electrically-conductive members, and the electrically-conductive members being held by the support for movement therewith. The electrically-conductive members have spaced-apart end regions, with an intervening region between the end regions defining a concentration zone. When the support is positioned such that the end regions of the electrically-conductive members are disposed in an electrolyte solution containing a polarizable analyte of interest, an AC power source is operable in combination with the electrically-conductive members to establish an electrical field gradient between the end regions effective to trap at least a portion of the polarizable analyte in the concentration zone.

As discussed above with regard to independent claim 1, *Hofmann* discloses a pair of spaced-apart electrodes that are immersed in liquid and have a coil surrounding the region between the electrodes. Particles within the liquid are sorted into various fractions by applying first and second electric signals to the electrodes and to the coil, respectively, to thereby generate substantially orthogonal oscillating electric and magnetic fields. *Hofmann* provides absolutely no teaching or suggestion of mounting the electrically-conductive members on a support for movement therewith. In fact, any modification of *Hofmann* to allow the electrically-conductive members to be moved in conjunction with a support would destroy the intended function of *Hofmann* since *Hofmann* discloses that the coil must surround the region between the electrodes such that the particles will be simultaneously subjected to orthogonal oscillating electric and magnetic fields that cause separation of the particles in liquid suspension. *Hofmann* discloses that baffles or other mechanisms could aid in extracting cell fractions from the container, but clearly provides no teaching or motivation whatsoever to remove the electrodes from the container as a means for extracting cell fractions from the container.

Dahms provides an automatic apparatus for loading known amounts of sample serum and electrophoretic medium into tubes, but clearly fails to provide any sort of teaching or suggestion of

electrically-conductive members held by a support for movement therewith. Accordingly, the proposed combination of *Hofmann* and *Dahms* does not teach or suggest all of the features in independent claim 4, and in particular, the combination does not disclose electrically-conductive members held by a support for movement therewith. Furthermore there is no suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the references as suggested in the Final Office Action since such a modification would destroy the intended function of the references.

Accordingly, for the reasons discussed above, the combination of *Hofmann* and *Dahms* fails to provide any disclosure or suggestion of the novel combination of features recited in independent claim 4. Appellants therefore submit that the Office Action fails to establish *prima facie* obviousness of the invention set forth in claim 4, and reversal of the final rejection under 35 U.S.C. § 103(a) is requested. Dependent claims 5-13 include all of the features of independent claim 4 and are therefore also patentable for at least the same reasons as discussed above with regard to claim 4.

(iii) Claims 5-7 and 10 are patentable over *Hofmann* and *Dahms*, further in view of U.S. Patent No. 4,643,814 (*Goldstein*).

As stated above, claims 5-7 and 10 include all of the features of independent claim 4, and are therefore also patentable for at least the same reasons as discussed above with regard to claim 4. *Goldstein* is relied upon for a teaching of placing a material such as an epoxy resin between electrically conductive members to facilitate the holding of an analyte material. *Goldstein* clearly does not overcome the above-noted deficiencies of *Hofmann* and *Dahms* since *Goldstein* fails to provide any teaching or suggestion whatsoever of electrically-conductive members held by a support for movement therewith.

(iv) Claim 13 is patentable over *Hofmann* and *Dahms*, further in view of WO 97/41219 (*WO '219*).

As stated above, claim 13 includes all of the features of independent claim 4, and is therefore also patentable for at least the same reasons as discussed above with regard to claim 4. *WO '219* is relied upon for a teaching of using a DC voltage to capture DNA from an analyte solution. *WO '219* clearly does not overcome the above-noted deficiencies of *Hofmann* and *Dahms*

since *WO '219* provides absolutely no teaching or suggestion of electrically-conductive members held by a support for movement therewith.

IX. Conclusion

For the reasons discussed in detail above, Appellants submit that independent claim 1 and dependent claims 2-3 are patentable over the combination of *Hofmann* and *Dahms*, and furthermore independent claim 4 and dependent claims 5-13 are patentable over the combination of *Hofmann* and *Dahms*, further in view of either *Goldstein* or *WO '219*. Accordingly, reversal of the final rejection of claims 1-13 under 35 U.S.C § 103(a) based on the disclosures of *Hofmann, Dahms, Goldstein,* and *WO '219*, is respectfully requested.

Respectfully submitted,

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X. Appendix

The Appealed Claims:

1. An analyte-manipulation device for moving a polarizable analyte of interest with respect to a sample holder configured to hold such analyte, comprising:

at least two coextensive, elongated, electrically-conductive members disposed in fixed, spaced relation; with said members and said holder being adapted for relative movement between a first position wherein at least a portion of said members is disposed within said holder and a second position wherein said members are disposed outside of said holder;

an AC power source adapted for electrical communication with said electrically-conductive members;

wherein, with said members and holder disposed at said first position, said AC power source is operable in combination with said electrically-conductive members to establish an electrical field gradient within said holder, adjacent said members.

2. The device of claim 1, further comprising a control unit for controlling the position of the electrically-conductive members with respect to said sample holder.

3. The device of claim 1, further comprising a holder-handling apparatus for moving said sample holder toward and away from said electrically-conductive members.

4. An analyte-manipulation device, comprising:

a movable support;

at least two coextensive, elongated, electrically-conductive members;

said electrically-conductive members being held by said support for movement therewith;

said electrically-conductive members having spaced-apart end regions, with an intervening region between said end regions defining a concentration zone;

an AC power source adapted for electrical communication with said electrically-conductive members;

wherein, upon positioning said support so that said end regions are disposed in an electrolyte solution containing a polarizable analyte of interest, said AC power source is operable in

combination with said electrically-conductive members to establish an electrical field gradient between said end regions effective to trap at least a portion of said polarizable analyte in the concentration zone.

5. The device of claim 4, further comprising a resin material, wherein at least a portion of each of said end regions of said electrically-conductive members is contained within said resin material.

6. The device of claim 5, wherein said resin material comprises an epoxy bead.

7. The device of claim 4, further comprising a porous material encapsulating said end regions.

8. The device of claim 4, wherein at least a portion of at least one of said electrically conductive members includes one or more surface features selected from the group consisting of edges, corners, angles, bumps, protrusions, teeth, undulations, notches, indentations, waves, ripples, fins, and any combination thereof.

9. The device of claim 8, wherein said members include surface features along confronting portions of their end regions comprising edges or points.

10. The device of claim 4, further comprising a non-conductive filament extending along at least one of said members.

11. The device of claim 4, wherein said support is configured as a handle permitting an operator to hold and position the device by hand.

12. The device of claim 4, wherein two or more pairs of said coextensive, elongated, electrically-conductive members are held by said support.

13. The device of claim 4, further comprising a DC power source adapted for electrical communication with said electrically-conductive members.